

**ABSTRACT OF THE DISCLOSURE**

A phase jump amplitude and timing controller is used in a fiber optic gyroscope for suppressing color noise. The phase jump amplitude and timing controller inserts a phase/voltage jump into the feedback signal of the loop closure electronics of the fiber optic gyroscope. This phase/voltage jump breaks the repeated pattern of the drive signal. The IOC time-dependent characteristics are totally eliminated by the randomized feedback signal because no repeated signal is applied to the IOC. The randomized amplitude is preferably within the full  $\pm\pi$  phase such that the optical errors average to zero. A fixed frequency higher than the interested spectral region can shift the color noise to higher frequency. A randomized frequency can spread the color noise over full spectrum, and totally eliminate the RDS. In other words, the color noise caused by the nonlinearity of the driving circuit and IOC spreads out over a wide range of spectrum such that no distinct frequency peaks are apparent in the spectral domain.

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